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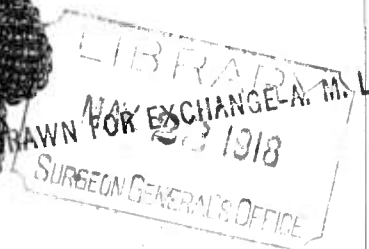
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BLACKBERRY CULTURE

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WITHDRAWN FOR EXCHANGE-A. M. L.

THE USE of the blackberry for canning and in the making of jam is increasing the demand for this fruit. It is now being grown profitably in many States, and in some sections its cultivation forms one of the important activities of the farmers.

In this bulletin directions are given for the propagation, planting, cultivation, pruning, and training of blackberries. The leading characteristics of the principal varieties are indicated.

While proper cultural methods are essential for the successful growing of this fruit, very much depends upon a suitable selection of varieties for planting in different sections of the country. Thus, in southern California the Crandall is the leading variety, while in the central and northern parts of that State the Lawton is an important variety for commercial purposes, and for home use and local markets the Mammoth and Himalaya are grown throughout the State; in Oregon and Washington the Snyder and Evergreen varieties are usually preferred; in the North-Central States the Eldorado, Snyder, and Mersereau are among the best sorts; in Kentucky and Tennessee the Early Harvest and Eldorado; in southern Missouri and in Arkansas the Early Harvest and McDonald; and in Texas the Dallas, McDonald, and Haupt varieties are desirable; in New Jersey the Ward and Evergreen (*Black Diamond*) are recommended; and in the other Eastern States the Eldorado and Snyder are widely grown.

BLACKBERRY CULTURE.

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ACCORDING to the reports of the 1910 census, there were in the United States 49,004 acres devoted to the cultivation of blackberries and dewberries.

Table I shows the distribution of this acreage by States. As dewberries are not grown extensively except in certain Southern States and New Jersey, the area devoted to blackberries in most of the States is not materially different from the figures given here.

TABLE I.—*Acreage devoted to blackberries and dewberries in the United States in 1909, by States.*

Geographic division and State.	Acreage.	Geographic division and State.	Acreage.
New England States:		South Atlantic States—Continued.	
Maine.....	145	North Carolina.....	1,233
New Hampshire.....	67	South Carolina.....	38
Vermont.....	47	Georgia.....	67
Massachusetts.....	287	Florida.....	13
Rhode Island.....	16	East South-Central States:	
Connecticut.....	128	Kentucky.....	2,141
Middle Atlantic States:		Tennessee.....	1,514
New York.....	1,951	Alabama.....	53
New Jersey.....	4,332	Mississippi.....	58
Pennsylvania.....	1,235	West South-Central States:	
East North-Central States:		Arkansas.....	525
Ohio.....	2,425	Louisiana.....	16
Indiana.....	1,347	Oklahoma.....	1,792
Illinois.....	3,503	Texas.....	2,773
Michigan.....	2,973	Mountain States:	
Wisconsin.....	407	Montana.....	34
West North-Central States:		Idaho.....	170
Minnesota.....	145	Wyoming.....	(¹)
Iowa.....	2,279	Colorado.....	228
Missouri.....	5,975	New Mexico.....	10
North Dakota.....	2	Arizona.....	16
South Dakota.....	5	Utah.....	95
Nebraska.....	428	Nevada.....	1
Kansas.....	2,682	Pacific States:	
South Atlantic States:		Washington.....	769
Delaware.....	1,256	Oregon.....	431
Maryland.....	1,180	California.....	2,576
District of Columbia.....	(¹)	United States.....	49,004
Virginia.....	344		
West Virginia.....	1,292		

¹ Less than 1 acre.

NOTE.—This bulletin is of interest to blackberry growers throughout the United States.

The cultivation of the blackberry has increased much less rapidly than would otherwise have been the case had not the wild forms of this fruit been found in such abundance in nearly every section of the country. With the gradual introduction of new and better varieties especially adapted to the different regions, the superior size and quality of the cultivated berries are beginning to be recognized. Commercial varieties produce firmer fruit, which can be held in good condition longer after picking. Moreover, by a proper selection of varieties fresh cultivated blackberries can be obtained before the first wild ones ripen, as well as long after the last wild ones are gone. When these points of superiority become more generally known, the use of the cultivated varieties will become more general.

LOCATION OF THE PLANTATION.

The principal factors to be considered in the selection of a location for a blackberry plantation are the facilities for marketing the fruit and the moisture conditions of the soil. The blackberry is a tender fruit, the keeping qualities of which are seriously affected by jarring over rough roads. It should therefore be grown adjacent to good roads, and the berries should be placed on the market as quickly as possible after they are picked.

The moisture supply in the soil at the ripening season and during the winter or dormant months is the most important factor to be considered in the selection of a site. The blackberry suffers more than almost any other crop from an insufficient water supply while the berries are growing and ripening. On the other hand, the plants are often killed if water stands on the plantation during the winter or dormant period.

In sections where there are frequent drying winds during the ripening period or during the winter it is important to choose a sheltered location. Low places where there is danger from late frosts, which may kill the new growth and destroy all prospects of a crop, should be avoided, and a site on high land with good air drainage should be selected.

SOILS.

The blackberry will flourish on nearly any type of soil provided suitable moisture conditions prevail. The finest wild berries are found in those localities where the humus and soil conditions are such that the plants can get a proper supply of water. The best blackberry land, therefore, is a deep, fine, sandy loam with a large supply of humus. Such a soil is to be preferred to a coarse sandy or a clay soil, since it can be controlled to a greater extent. The largest yields are produced on soil with a friable subsoil which allows the roots of the plants to penetrate to a good depth and get food and moisture from the greatest possible area.

PREPARATION OF THE SOIL.

The land on which blackberries are to be grown should be planted with a cultivated crop the season previous to the setting of the berry plants. This will insure the thorough rotting of the sod and will help to destroy the cutworms and other insects which are often injurious to the young plants. The soil should be plowed to a depth of about 9 inches in the spring, and a thorough harrowing should be given the whole field before the plants are set. In order to provide a suitable subsoil it will frequently pay to loosen it with a subsoil plow during the previous fall.

PROPAGATION.

The roots of blackberries live for many years, but the canes only last two years. These canes grow from the crown in the spring and live until after the fruiting season of the following year. When they die, other canes are ready to take their places, having grown from the crown during the spring, to die at the end of the fruiting season of the succeeding year. Berries are borne only on canes which are in their second season's growth. These statements do not apply to the Evergreen and Himalaya varieties, the canes of which are perennial in some sections.

In addition to the canes which grow from the crown, it is the habit of the plant to throw up suckers from the roots at various distances from the parent plant, especially where the roots are cut. New plants are usually secured by digging up these suckers, and when the suckers are vigorous this method of starting new fields is very satisfactory.

Another method used by nurserymen during the fall or early spring in order to secure new plants is to dig roots of the desired variety one-fourth of an inch or more in diameter. These are cut into pieces about 3 inches long and planted horizontally about 3 inches deep in trenches. By the following fall these should furnish strong plants, generally with a better root system than "sucker" plants, which depend upon the single large root from the parent plant for most of their food and water.

Certain varieties are blackberry-dewberry hybrids and have canes which root at the tips, like the dewberry. The Evergreen and Himalaya varieties, although not dewberry hybrids, also have tips that root. New plants of these varieties are secured either by covering the tips with soil in late summer or by making root cuttings, as with other blackberries.

POLLINATION.

Practically all of the blackberry varieties which have no strain of dewberry parentage are entirely self-fertile and may be planted by themselves without provision for cross-pollination. The Rathbun, Mammoth, McDonald, Wilson, and other less well-known

varieties are reported to be imperfect pollenizers under certain conditions and should not be planted in large blocks alone.

PLANTING.

Blackberry plants are usually set as early in the spring as the land can be properly prepared, since the soil generally contains more moisture at that time and the young plants can secure a vigorous start. The earlier they are set, the larger the proportion that live and the better their growth. When early spring setting is impossible, the plants may be set in the late fall if there is no danger from drying winds during the following winter. The roots of newly set plants can not supply as much moisture as those of plants which have grown in the soil for a season. They should be set as deep as they formerly stood in the nursery, or slightly deeper, for the canes break easily if the crowns project above the surface of the ground. The tops should be cut back to 6 inches or less in length.

In the Eastern States blackberries are usually planted 3 feet by 8 feet. In localities where the canes grow very large, as they frequently do on the Pacific coast, they should be set at least 4 feet apart in rows 8 feet apart. Planting distances for the Evergreen and Mammoth varieties are given with their descriptions on pages 14 and 15. This planting system allows cultivation in but one direction. When cultivation in both directions is desired, the plants are usually set 5 feet by 5 feet; this distance may be increased to 7 or 8 feet apart both ways if the growth is very vigorous. Very little hand labor is needed when the plants are set according to this plan, as the cultivation keeps down both weeds and suckers.

INTERCROPS.

During the first summer after the plants are set some intercrop may be grown between the rows. This crop should be one requiring constant cultivation throughout the growing season of the blackberry and its growth should not be large enough to shade the plants. The selection of a suitable intercrop should greatly reduce the cost of the berry field during the first summer, without injuring the plants. Truck crops, such as cabbage and potatoes, are to be preferred for this purpose, while corn and the small grains should be avoided. Only a single row of most truck crops should be grown between the blackberries. By the second summer the plants should be large enough to occupy all of the space.

CULTIVATION.

Whether an intercrop is grown or not, cultivation should be begun as soon as the plants are set in the spring and should be continued at intervals of from one to two weeks throughout the season. It

should usually be discontinued at least a month before freezing weather sets in. The purpose of this clean cultivation is to provide a dust mulch for the retention of moisture and to keep down suckers and weeds. Since the roots of the blackberry ordinarily lie close to the surface of the ground, cultivation must be shallow. The breaking of the roots not only weakens the root systems of the plants but increases the number of suckers. The deeper the soil and the more thorough its preparation before the plants are set, the deeper will be the position of the roots. Frequent cultivation is of greater importance during the growing and ripening season of the berries than at any other time, since more moisture is required then.

FERTILIZERS.

The fruit, foliage, and canes of the blackberry remove a large quantity of plant food from the ground each year. Most soils, however, have sufficient nitrogen, potash, and phosphoric acid to grow full crops of fruit for many years. Some are better supplied with one element than with others, and each grower must know his own soil before he can make profitable use of commercial fertilizers. Nitrogen should be used with caution after the berry field is in bearing, as it may cause a rapid cane and leaf growth at the expense of fruit bearing.

Stable manure is the best fertilizer to use, for in addition to supplying the elements of plant food it adds much humus to the soil. An annual application of 20 tons of stable manure to the acre will usually be sufficient, although there is little danger of using too much, especially after the field is in bearing. In order to supply humus, leguminous and other cover crops should either be plowed under before the plants are set, or grown between the rows of blackberries each year. When such crops are grown, less stable manure will be required.

SYSTEMS OF TRAINING.

If all of the suckers which appear were allowed to grow, by the end of the second year the field would be a dense thicket of blackberry canes, from which the berries could only be picked with great difficulty. The suckers would compete with the parent plants for food, moisture, and light, and the whole plantation would be inferior. The plants must therefore be kept in rows or hills, and all suckers appearing between the rows must be destroyed by the frequent use of cultivator and hoe. Suckers do not reappear as rapidly if they are pulled, but this requires much hand labor. If all are destroyed, the plants will have much stronger roots and canes and the berries will be larger and better.

As soon as the last berries have been picked, the old canes which have just borne fruit should be cut out and burned. This allows the young canes more room in which to develop and destroys any insects or diseases on the old canes. It will rarely be necessary to leave them to support the new canes during the winter snows. Wire trellises are usually to be preferred where support is needed. Not more than three or four new canes to each plant should be allowed to grow in one season, and all in excess of this number should be cut out not later than the time of the removal of the old bearing canes. The remaining canes will be larger and stronger because of the thinning.

The systems of training vary in accordance with conditions in different sections of the country. In some sections where the plants do not grow large and where the soil does not wash, the new canes may be "topped"—that is, the tips pinched off with the fingers—when they reach a height of not more than $2\frac{1}{2}$ feet. When the bushes



FIG. 1.—Blackberries held upright by a single-wire trellis.

are very vigorous, the height may be increased to 3 feet. As the canes do not all reach the height of $2\frac{1}{2}$ feet at the same time, the plantation must be gone over several times at frequent intervals. The pinching causes the canes to branch and to be better able to stand erect with a heavy crop of berries.

Even when this method of training is used, the canes may be bent over and broken either by tillage implements or by the pickers, the number of canes and the quantity of fruit being thus materially reduced. Under such conditions sufficient fruit will be saved by the use of a wire trellis to make the latter a profitable investment. Such a trellis consists of posts set in each row at intervals of from 15 to 30 feet; the canes are tied to a wire stretched along this line about $2\frac{1}{2}$ feet above the ground. This keeps the canes upright and makes cultivation and picking much easier. Figure 1 shows a blackberry

field where such a trellis is in use, and figure 2 shows a detailed drawing of the trellis.

A variation of this trellis is made as follows: Crosspieces about 18 inches long are nailed to the top of each post and two wires instead of one are stretched along the line of posts from the ends of the crosspieces. The blackberry canes are simply kept inside these wires, which form a support for them on either side. Figure 3 shows such a trellis.

These systems of training are adapted to certain varieties and to those sections of the country where the bushes do not grow very high.

When the canes grow very long or are inclined to run somewhat like a grapevine, a much higher trellis is used, with two wires, one about 5 feet and the other about 3 feet from the ground, the height depending, of course, upon the vigor of the plants. Figures 4 and 5 show such trellises.

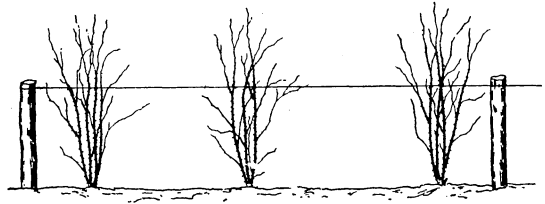


FIG. 2.—Blackberry canes of the upright type tied to a single wire.

The canes of the erect varieties are simply fastened to the wires, while those of the trailing varieties are tied either horizontally along the wires or in a fan-shaped position.

A variation of this trellis is used in some sections where the trailing varieties are grown. Two crosspieces 18 or 20 inches long are nailed to each post, one near the top and the second about 2 feet below. Wires are strung along the ends of the crosspieces on the posts. Sometimes both bearing and nonbearing canes are trained to the same

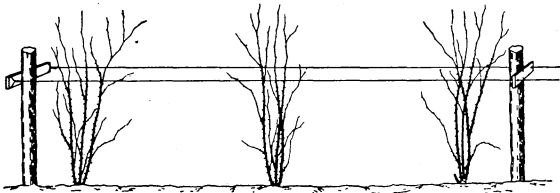


FIG. 3.—Blackberry canes of the upright type held between two wires.

wires, frequently the nonbearing canes on the lower wires and the bearing canes on the upper wires and sometimes vice versa. Figure 6 shows the arrangement of the wires for this system.

The systems of training described above are the ones usually found, but they are often varied to suit particular conditions or the convenience of the grower. When the plants are set in hills 5 or more feet apart each way, the canes may be pinched back at a height of about 3 feet in order to make a stocky growth. Frequently, when the plants are set in hills, a post is set by each plant and the canes tied to it. The trailing varieties, with the exception of the Mammoth, are rarely trained to the hill system. The latter system of training is illustrated in figures 7 and 8.

MULCHING.

Mulching is very expensive, and is therefore better adapted for use in home gardens than in commercial blackberry fields. In localities where straw, hay, leaves, or other mulching materials are very cheap and where there is no serious danger from fire, they may be profitably used on a commercial scale. If the mulch is deep enough, it will assist in keeping down suckers, and as it removes the necessity for

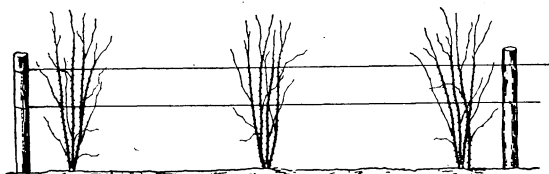


FIG. 4.—Blackberry canes of the upright type tied to two wires, one placed above the other.

cultivation, no roots are broken from which suckers may spring. A mulch will greatly retard the evaporation of moisture from the ground, and in this respect will be more effective than

the best cultivation. It should not be applied, however, in localities where there is danger of water standing on the soil at any time.

HARVESTING.

Each variety must be harvested according to its particular season of maturity. Some varieties may be picked soon after the berries turn black, while others turn black before they are ripe. They should be picked while still firm enough to market properly, but not before they become sweet.

The keeping quality of any variety is largely dependent upon the care exercised in picking and handling. If the berries are bruised or injured, molds and decay fungi enter and quickly destroy the fruit. On the other hand, blackberries carefully



FIG. 5.—Blackberry canes of the trailing type trained along two wires.

picked and stored in a cool place will keep fresh for several days.

YIELDS.

The yields of blackberries depend upon the varieties which are selected and upon the conditions under which they are grown. In certain sections of the country, where the soil is very deep and rich, yields of 5,000 or more quarts per acre may be secured. Under average conditions of good management, about 2,300 quarts per acre can be harvested. In some seasons this yield will be greatly exceeded, while in other years a smaller yield will be obtained. The Mammoth, Evergreen, and Himalaya varieties regularly yield much

more than 2,300 quarts in those sections of the Pacific slope to which they are adapted. With good care 7,000 or more quarts per acre of the Evergreen and Himalaya berries can be secured there.

WINTER PROTECTION.

The hardy varieties of blackberries will withstand temperatures of -30° F., provided water does not stand in the soil about the roots and there is no danger from severe drying winds. Many varieties are hardy enough to survive -40° F. without injury. In localities where there is real danger from cold, drying winds, as in the Central



FIG. 6.—Blackberry canes of the trailing type trained along four wires.

Western States, or from too severe winter temperatures, the canes are bent over in the fall and a layer of earth, hay, straw, or coarse manure is thrown over them. This should be done before the ground is frozen, yet after all danger of warm weather is past. Few canes will break if they are bent over while the sap still circulates. Sometimes the soil is drawn away from one side by means of a hoe or

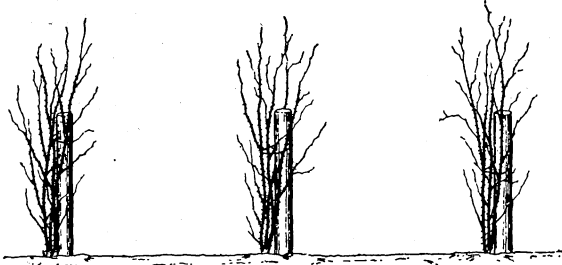


FIG. 7.—Blackberry canes of the upright type tied to posts.

plow and the plants inclined to that side before being covered. The canes will lie in a more nearly horizontal position with less danger of being broken when this is done, although the roots may be somewhat

injured when the earth is removed. The plants are uncovered in the spring after all danger of severe weather is past.

DURATION OF PLANTATION.

The roots of blackberry plants live for many years, but the length of time that a plantation is profitable varies with conditions in different parts of the country. In sections where the humus burns out of the soil quickly and where the soil washes easily the plantation should be abandoned after five or six crops have been harvested. In other sections, where the humus supply is maintained and where the crowns do not become diseased, the plantation may be kept longer.

INSECTS AND DISEASES.

It is essential for success in growing blackberries that only plants free from insects and diseases be planted. Crown-gall and rust are serious and incurable, and all plants infested with these diseases must be dug out and burned. The insect pests of the blackberry are not often serious. For information in regard to the control of any insect or disease, write to the nearest State agricultural experiment station or to the United States Department of Agriculture, Washington, D. C., and furnish specimens of the affected parts. Specific information to suit local or individual needs will gladly be sent.



FIG. 8.—Blackberries trained to single posts.

REGIONAL ADAPTABILITY OF VARIETIES.

The blackberry is cultivated throughout the United States, with the exception of southern Florida, the colder parts of Wisconsin, Minnesota, North Dakota, South Dakota, Wyoming, Colorado, and Montana, and those sections of the arid Western States where hot, dry winds destroy the ripening fruit. In the Northern States just mentioned the canes and frequently the roots are killed by cold, dry winds. By protecting the plants in winter, however, blackberries can be grown in some parts of this region.

It is necessary to classify the varieties according to their resistance to severe weather conditions. In the varietal characterizations, pages 13 to 15, they are termed hardy, half-hardy, and tender. A hardy

variety should be able to withstand a winter temperature of -30° F. in a protected place, as well as the changing temperature of the Middle Western States, where comparatively high winter temperatures sometimes occur. A half-hardy variety winterkills in places where the temperature goes as low as -30° F. It may pass through some winters safely, but at other times it may freeze to the ground. This half-hardy class is also severely injured by the frequent temperature changes which occur in winter in certain sections of the Middle Western States. The tender varieties are adapted to the Southern States, where mild winters prevail. They will not stand low temperatures and should only be planted where the thermometer seldom reaches zero.

Varieties have been originated in the Southwest which are peculiarly adapted to the semiarid conditions there prevailing. These varieties, which include the Dallas, McDonald, and Haupt, are somewhat drought resistant and mature their fruit before the season becomes too warm for normal ripening.

The Pacific coast region grows many of the varieties common in the East as well as another class of blackberries not adapted to cultivation in other sections of the United States. The varieties usually grown on the west coast are the Kittatinny, Lawton, Snyder, Crandall, Himalaya, Evergreen, and Mammoth, the last four of which are rarely grown successfully elsewhere. Even on the Pacific coast there is such wide variation in temperature, winds, and moisture supply that some of these varieties can be grown only in certain sections.

In order to determine the varieties which should be grown in any particular section, first decide whether the local conditions will permit the cultivation of the tender or half-hardy blackberries. It will not be profitable to plant varieties which are not sufficiently hardy. Inquiry among neighboring growers will determine the varieties which have already proved successful, and the most promising of these should be selected.

VARIETAL CHARACTERIZATIONS.

The following characterizations are intended to aid the prospective grower in his selection of varieties adapted to his section and to the purposes for which he intends to grow blackberries. Only those varieties which are successfully grown throughout large areas of the United States have been included:

Blowers.—New York origin. Berries large, firm, acid till ripe, quality good. Season medium, but the variety ripens throughout a long period. Bush vigorous, hardy, productive. Adapted to the Northeastern States; also grown successfully in Kentucky and Michigan.

Briton (*Ancient Briton*).—Wisconsin origin. Berries large, not very firm, very good quality. Season medium to late. Bush moderately vigorous, thorny, very hardy,

very productive. Grown chiefly in Wisconsin and Minnesota. Grown somewhat throughout the Northern States east of the Rocky Mountains.

Crandall (*Macatawa, Santa Cruz Seedless, Navlet Seedless, Everbearing*).—Texas origin. Berries large, firm, sweet, quality very good. Season very early and the variety ripens through a long period. Bush vigorous, productive, makes few suckers, tender, limits of hardiness not known. The leading variety in southern California; not adapted to the Northeastern States.

Dallas.—Texas origin. Berries large, firm, very good quality. Season early. Bush vigorous but low growing, hardiness not known, productive. Grown in Texas and Oklahoma.

Early Harvest.—Illinois origin. Berries medium size, firm, quality good. Season very early and the variety ripens through a long period. Bush moderately vigorous and does not sucker as much as some. Very productive in the South. Very susceptible to rust. Not hardy in the North. Would be a most desirable variety in the South except for rust; it is the most widely grown there.

Eldorado.—Ohio origin. Berries medium to large, firm, sweet, quality very good. Season early to medium and long. Bush very vigorous, hardy, and productive. The most resistant to rust of any of the widely grown varieties. One of the best varieties in most of the sections adapted to blackberries east of the Rocky Mountains except the extreme South and northern New England.

Erie.—Pennsylvania origin. Berries medium to large, very firm, acid till ripe, quality very good. Season medium. Bush very vigorous, hardy, productive. Susceptible to rust. Grown to a limited extent in the Northeastern States and in Missouri.

Evergreen (*Black Diamond, Star, Wonder, Ewing Wonder, Everbearing, Atlantic Dewberry*).—Origin unknown but grown in Europe since 1809. Berries large, firm, sweet, quality very good, seeds large. Season late to very late and long. Bush vigorous, tender, productive, deep rooted and drought resistant; canes semitrailing, perennial in some sections, but they should always be trained as though they were biennial like other varieties, root at tips. One of the best varieties in Oregon and Washington, but not generally adapted to the States east of the Rocky Mountains, because the fruit is small and worthless except in New Jersey, where it is grown considerably with success. Planting distances, 6 by 6 feet in New Jersey; 16 to 24 feet by 8 feet in Oregon and Washington, according to conditions. This variety is found growing wild in Oregon and Washington.

Haupt.—Texas origin. Berries large, fairly firm, quality good. Season very early. Bush very productive, probably tender except in Texas and other Southern States; canes trailing the first year, more upright the second year, root at tips. Grown in central and eastern Texas, where it is a desirable variety, ripening about two days after the McDonald. Not liked in Missouri.

Himalaya.—California origin. This variety comes from a central European form of blackberry and is the standard berry for its season in California, both for the home garden and for local markets. It is grown slightly in Oregon and Washington, but is not generally liked there as well as the Evergreen. It is not adapted to the northern part of the United States east of the Rocky Mountains, but because it ripens later than other blackberries it may prove of some value for home use and local market in some parts of the South. In California the berries are of medium size, rather soft, sweet, quality good to very good. Season very late. Bush very vigorous, half hardy, very productive in some sections; canes semitrailing, root at tips, perennial in California and in some other regions but biennial under some conditions. Planting distance 8 by 8 feet in southern California to 8 by 20 to 30 feet in Washington, the distance varying according to vigor.

Iceberg.—California origin. Berries large, amber-white, soft, quality very good. Season medium. Bush half hardy. Desirable for home use because of its color. Not adapted to market use.

King (Early King).—Berries medium to large, very attractive in color, fairly firm, very sweet, quality very good. Season early and short. Bush vigorous but low, hardy, moderately productive, thorny. Susceptible to rust. Adapted to the milder parts of the East.

Kittatinny.—New Jersey origin. Berries large to very large, fairly firm, sweet, quality very good. Season medium early. Bush vigorous, half hardy, productive. Very susceptible to rust. Adapted to sections where rust is not serious and where the climate is not severe. Grown in many parts of the United States from the Atlantic to the Pacific.

Lawton (New Rochelle).—New York origin. Berries large, soft when fully ripe, sweet, quality good. Season medium. Bush vigorous, nearly hardy, productive, susceptible to rust. Grown extensively on the Pacific coast and somewhat in all parts of the United States eastward except in the South. Especially liked for canning.

McDonald.—Berries large, firm, quality very good. Season very early, two weeks before Dallas and Early Harvest. Bush very vigorous, range of hardiness not known, very productive, drought resistant; canes trailing the first year, more upright the second year, root at tips. A blackberry-dewberry hybrid. Not a good pollenizer and should be planted with another variety which blossoms at the same time. Grown in Texas, Oklahoma, and Missouri.

Mammoth.—California origin. Berries very large, soft, sweet, quality very good. Season very early. Bush very vigorous, tender, very productive; canes semitrailing, root at tips. Adapted to the milder parts of the Pacific coast. Planting distances, 8 to 15 feet by 8 feet when planted in rows; in hills, the same as for others. This variety is self-sterile and hence should be planted with another variety that blossoms at the same time.

Mersereau.—New York origin. Berries large, firm, sweet, quality very good. Season medium and short. Bush vigorous, hardy, productive, susceptible to rust, fairly drought resistant. Grown throughout the northern part of the Central-Western and Eastern States.

Rathbun.—New York origin. Berries large, firm, quality good. Season early to medium. Bush a vigorous grower, suckers sparingly, half hardy, moderately productive; root at tips. Very productive in some sections. A blackberry-dewberry hybrid. Not always a good pollenizer. Susceptible to rust. Grown in sections with mild winters east of the Rocky Mountains. Well liked in some parts of Michigan and Oregon, but not as popular elsewhere as other varieties.

Snyder.—Indiana origin. Berries of medium size, not very attractive, firm, quality good. Season medium and short. Bush vigorous, very hardy, productive, does not produce many laterals. Does not rust as badly as most varieties. Susceptible to dry weather. Not adapted to heavy clay land. Grown in all parts of the United States from the Atlantic to the Pacific except the South.

Taylor.—Indiana origin. Berries medium size, soft, quality very good. Season late. Bush vigorous, very hardy, moderately productive. Not very susceptible to rust. Grown for a late berry from the Rocky Mountains eastward except in the extreme South.

Ward.—New Jersey origin. Berries large, firm, sweet, quality good. Season late. Bush vigorous, hardy, productive. Grown in New Jersey and somewhat in the northern part of the United States east of the Rocky Mountains.

HYBRIDS AND NOVELTIES.

Several hybrids of the blackberry and dewberry have been classed in this bulletin with the blackberry. Hybrids of the blackberry and raspberry have not been discussed. As yet none of the many recent introductions of blackberry species from different countries have

proved to be of commercial value. There is, however, little doubt that varieties especially adapted to local conditions in each section of the country will be found. The varieties described in this paper are those which are best known at the present time.

BLACKBERRY BY-PRODUCTS.

Besides being eaten fresh, the blackberry is dried, canned, made into jam, jellies, and other preserves, and pressed to extract the juice. Dried blackberries are not used as much as formerly, because more convenient methods of preserving have been developed.

The introduction of the lacquered-tin can, which does not discolor the contents as does the ordinary tin when it comes in contact with this acid fruit, has assisted in the rapid expansion of the blackberry-canning industry. The berries may be preserved in a sugar solution or, as is more customary, preserved without sugar by heating. This latter process is very inexpensive and is more satisfactory for the trade, since berries put up in this way can be used for many purposes for which berries preserved with sugar would be unsuitable.

